REMARKS

The Office Action mailed June 4, 2008, and made final, has been carefully reviewed and the following remarks have been made in consequence thereof.

Claims 1, 3-6, 8-20, and 22 are now pending in this application. Claims 1, 3-6, and 22 stand rejected. Claims 8-20 have already been withdrawn from consideration. Claims 2, 7, and 21 have already been cancelled. No new matter has been added.

The rejection of Claims 1 and 3-6 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 6,438,838 (Meier et al.) in view of U.S. Patent 3,650,635 (Wachtell et al.) or in the alternative as being obvious over Meier et al. in view of U.S. Patent 6,912,446 (Wang et al.) and Wachtell et al. is respectfully traversed.

Meier et al. describe a method for repairing a vane (5) for a turbine. The repair method includes severing and removing a damaged section (4') of vane (5) along a plane (12) such that a stub (13) is formed. During the repair process, an inductor (16) is coupled to a periphery (15) of stub (13) to heat and soften periphery (15). A replacement vane (20) that corresponds in shape and curvature to stub (13) is aligned and welded to stub (13) in a protective gas atmosphere using high-frequency welding. Specifically, when a high-frequency current is applied to inductor (16), the material of stub (13) and replacement vane (20) melts to enable replacement vane (20) and stub (13) to be bonded together. Notably, Meier et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a titanium alloy.

Wachtell et al. describe a method for repairing damaged or defective turbine guide vanes (21). A substantially-rectangular, longitudinal section of the vane including the defect (not shown) is cut from the vane (21) and removed. A substantially-rectangular, longitudinal insert (23) is welded to the vane (21) using either tungsten inert gas welding or electron beam welding to couple the replacement insert (23) to the remaining vane (21). The insert (23) includes columnar grains that extend along a trailing edge of the vane (21) such that grain boundaries are substantially eliminated normal to the edge of the insert (23). Notably, Wachtell et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at

least one of a nickel alloy and a titanium alloy. Moreover, Wachtell et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with resistance welding.

Claim 1 recites a method of replacing a portion of a gas turbine engine rotor blade, wherein the method comprises:

> [C]oupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a titanium alloy to form a single weld joint extending along the cut line such that a newly formed rotor blade is formed with an aerodynamic contour that is one of an improvement in aerodynamic performance over the original blade contour and mirroring the original blade contour.

Applicants respectfully submit that no combination of Meier et al. and Wachtell et al. describes nor suggests a method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1. Specifically, no combination of Meier et al. and Wachtell et al. describes nor suggests coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a titanium alloy. Rather, in contrast to the invention, Meier et al. describe a method for bonding vanes to a rotor carrier using resistance welding, and Wachtell et al. describe coupling an insert to a turbine engine blade using an electron beam weld. As such, no combination of Meier et al. and Wachtell et al. describes nor suggests the recited step of a single-pass weld, nor the recited use of a specific welding material.

Regarding the traversal of the alternative rejection, Meier et al. and Wachtell et al. are described above.

Wang et al. describe a method for repairing an airfoil (34). A computer (60) generates a numerically-controlled (NC) tool path for use by an NC machine (62) with a tool holder (64) and cutting tool (68). A plate is welded to the surface of a fan blade (8) with a weld material of the same material as the plate and fan blade (8). The displacement-sensing probe (66) scans the shape of the fan blade (8), including the weld-repaired airfoil portion (34), and sends the data to the computer (60). An NC tool path is then generated to blend the weld-repaired region smoothly with its adjacent surfaces. Notably, Wang et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a

titanium alloy. Moreover, Wang et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with resistance welding.

Claim 1 is recited above.

Applicants respectfully submit that no combination of Meier et al., Wachtell et al., and Wang et al. describes nor suggests a method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1. Specifically, no combination of Meier et al., Wachtell et al., and Wang et al. describes nor suggests coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a titanium alloy. Rather, in contrast to the invention, Meier et al. describe coupling vanes to a rotor carrier using resistance welding, Wachtell et al. describe coupling an insert to a turbine engine blade using an electron beam weld, wherein the turbine components are fabricated from a nickel-base alloy, and the insert is fabricated from the same material as the cutout, and Wang et al. describe coupling a plate to a blade, wherein the plate and the weld material are the same material as that of the blade. As such, no combination of Meier et al., Wachtell et al., and Wang et al. describes nor suggests the recited step of a single-pass weld or the recited use of at least one of a nickel alloy and a titanium alloy for the welding material.

Moreover, if art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. *U.S. v. Adams*, 148 USPQ 479 (1966); *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Moreover, Applicants respectfully submit Wang et al. teach away from the method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1. Specifically, Wang et al. describe a method of coupling a blade to a plate, using the same material as that of the blade for the weld material and plate. As such, Wang et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a titanium alloy as is recited in Claim 1. Accordingly, Applicants respectfully submit that the cited art as a whole teaches away from Claim 1 as recited.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted as patentable over Meier et al. in view of Wachtell et al. and patentable over Meier et al. in view of Wang et al. and Wachtell et al.

Claims 3-6 depend from independent Claim 1. When the recitations of Claims 3-6 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that dependent Claims 3-6 likewise are patentable over Meier et al. in view of Wachtell et al. and patentable over Meier et al. in view of Wang et al. and Wachtell et al.

For at least the reasons set forth above, Applicants respectfully request that the rejection of Claims 1 and 3-6 under Section 103 be withdrawn.

The rejection of Claim 22 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 6,438,838 (Meier et al.) in view of U.S. Patent 6,912,446 (Wang et al.) and U.S. Patent 3,650,635 (Wachtell et al.) as applied to Claim 1 and further in view of U.S. Patent 6,238,187 (Dulaney et al.) is respectfully traversed.

Meier et al., Wang et al., and Wachtell et al. are described above.

Dulaney et al. describe a method for repairing a damaged airfoil. The repair method includes removing (step 24) damaged portions or sections (12 and 16, for example) of airfoil (10) and replacing (step 26) these portions (12 and 16) with replacement pieces (44 and 46, for example). Replacement pieces (44 and 46) are integrally joined to airfoil (10) using a joining (step 28) operation to form a refurbished airfoil that includes a seam (78) defined between the airfoil (10) and the replacement piece (44 and 46). The refurbished airfoil is shaped (step 29) by removing the excess material from replacement piece (44 and 46) and seam (78) to return the joined airfoil to predetermined dimensional tolerances. A laser shock peening treatment (step 30) induces the formation of compressive residual stresses at the seam (78). Notably, Dulaney et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a titanium alloy. Moreover, Dulaney et al. do not describe nor suggest coupling a replacement blade portion to a remaining blade portion with resistance welding.

Claim 1 is recited above.

Applicants respectfully submit that no combination of Meier et al., Wachtell et al., Wang et al., and Dulaney et al. describes nor suggests a method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1. Specifically, no combination of Meier et al., Wachtell et al., Wang et al., and Dulaney et al. describes nor suggests coupling a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material that includes at least one of a nickel alloy and a titanium alloy. Rather, in contrast to the invention, Meier et al. describe bonding vanes to a rotor carrier using resistance welding, Wachtell et al. describe coupling an insert to a turbine engine blade using an electron beam weld, Wang et al. describe coupling a plate to a blade, wherein the plate and the weld material are the same material as that of the blade, and Dulaney et al. describe shaping the joined airfoil and replacement piece by removing the excess material using machine tooling, contour milling, and a hand-contour blend grind. As such, no combination of Meier et al., Wachtell et al., Wang et al., and Dulaney et al. describes nor suggests the recited step of a single-pass weld or the recited use of at least one of a nickel alloy and a titanium alloy for the welding material.

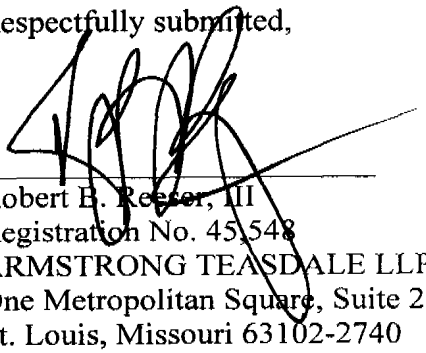
Accordingly, for at least the reasons set forth above, Claim 1 is submitted as patentable over Meier et al. in view of Wachtell et al. and patentable over Meier et al. in view of Wang et al. and Wachtell et al. and further in view of Dulaney et al.

Claim 22 depends from independent Claim 1. When the recitations of Claim 22 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that dependent Claim 22 likewise is patentable over Meier et al. in view of Wang et al. and Wachtell et al. and further in view of Dulaney et al.

For at least the reasons set forth above, Applicants respectfully request that the rejection of Claim 22 under Section 103 be withdrawn.

In view of the foregoing remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,



Robert B. Reeser, III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070